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MASTER OF MILITARY STUDIES

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THE MARINE EXPEDITIONARY BRIGADE AND A RETURN TO AN EXPEDITIONARY  
MARINE CORPS STRATEGY

**AUTHOR:**

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## **Executive Summary**

**Title:** First to Fight in the Next Fight?: The Marine Expeditionary Brigade and a Return to an Expeditionary Marine Corps Strategy

**Author:** Major William G. Clester, United States Marine Corps

**Thesis:** In order to remain amphibious and expeditionary, the Marine Corps needs to establish standing Marine Expeditionary Brigade (MEB) headquarters by implementing simple, yet innovative, changes in the areas of manning, training, and equipping.

**Discussion:** This paper examines the Marines Corps' place in protecting vital national interests and its approach to war today, with respect to future strategic planning and procurement and possibilities to return to its amphibious and expeditionary traditions. The purpose of this paper is to examine current policies and understand how the Marine Corps should posture itself for the future, to include the needs for a forcible entry capability and lighter Marine Air-Ground Task Forces. This paper advocates reestablishing a standing MEB headquarters to provide operational oversight of Marine or Joint assets in order to conduct forcible entry operations during combat or security operations. The MEB can also better provide focus and continuity for lower-intensity, but equally important, operations such as theater security cooperation training with partner nations or relief and reconstruction operations for humanitarian crises. Particular attention is paid to the Marine Corps' legal responsibilities under Title 10 of the United States Code and the new guidance from the Commandant of the Marine Corps in the *United States Marine Corps Service Campaign Plan 2009-2015*. After addressing the improved operational capabilities a standing MEB could contribute, this paper will present several possibilities in lightening the load of Marines and units in order to maintain a light, expeditionary capability without sacrificing warfighting capabilities.

**Conclusion:** With an increase in MEB amphibious expeditionary capabilities, Marines will be poised to be the first to fight the next fight, or at least the first to conduct the next expeditionary operation as the United States' force in readiness, be it security, engagement, or relief and reconstruction.

## DISCLAIMER

THE OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE MARINE CORPS COMMAND AND STAFF COLLEGE OR ANY OTHER GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT.

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## *Preface*

Having completed several deployments within the European Command, Central Command, Africa Command, and Pacific Command Areas of Responsibility, I have noticed the lack of persistence and continuity between Marine Corps units and our partner nations as units transit an Area of Responsibility. Some of the Marine Corps' Theater Security Cooperation training evolutions with allied nations have resulted more in half-hearted publicity rather than in tangible security enhancement, but the United States owes it to our partners to keep them in our attention span a little longer. This can easily be remedied by establishing dedicated staffs to focus on smaller regions, or even single countries, within a Combatant Command's Area of Responsibility. I also realized that the Marine Corps, other than organization, has no guarantees in Title 10 for maritime sealift and is somewhat handicapped by the Navy in determining exactly what naval transportation capabilities are required in order for it carry out its Title 10 responsibilities, particularly for forcible entry. The Commandant of the Marine Corps' recent initiatives in Security Cooperation Marine Air Ground Task Forces and "lightening the load" further spurred me to write this paper. Much of the information contained herein regards current policies and events as of 2010 and is therefore admittedly ephemeral, but my intent is for some of these aspects to make it into further discussions, or even decisions, on how the Marine Corps should posture itself to remain relevant for the near future.

I am deeply indebted to the patience and guidance of my thesis advisor Dr. Rebecca J. Johnson. Additional thanks are due to Lieutenant Colonel Michael L. Carter, USMC for our lengthy conversations on amphibious and Joint operations and to Lieutenant Colonel Paige L. Chandler, USMC for his sanity checks on my arguments. Finally, and most importantly, loving

thanks go to my wife, Theresa, and my children, Maggie and Alex, who reluctantly, but understandably, forfeited many an evening and weekend with me so that I may pursue this labor.

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## **Introduction**

Today the United States stands alone as the world's sole superpower. This paper will examine the Marines Corps' place in protecting vital national interests and the Marine Corps' approach to war today, with respect to future strategic planning and procurement and possibilities to return to its amphibious and expeditionary traditions. The purpose of this paper is to examine current policies and understand how the Marine Corps should posture itself for the future, to include the needs for a forcible entry capability and lighter Marine Air-Ground Task Forces (MAGTFs) organized in the structure of standing Marine Expeditionary Brigades (MEBs). The Marine Corps' strategic relevance to execute national policy in future conflicts directly influences Congressional funding to man, train, and equip the Marine Corps.<sup>1</sup>

The current Marine Corps is the result of both conventional and irregular warfare over the past two decades, ranging from major combat operations in Kuwait, Iraq, and Afghanistan to security, engagement, and relief and reconstruction operations in Somalia, Lebanon, and Haiti. The Marine Corps is caught between the two extremes of remaining on its current course of fulfilling the role of an ever heavier "second land army" for conventional warfare or adopting a lighter, specifically land-based approach for lower-intensity missions, such as stability operations. Neither option preserves the Marine Corps' amphibious heritage.<sup>2</sup> If the Marine Corps is to continue to fight the nation's battles and win wars, it must remain light and flexible while retaining the ability to strike decisive blows when needed. In order to remain amphibious and expeditionary, the Marine Corps needs to establish standing MEB headquarters by implementing simple, yet innovative, changes in the areas of manning, training, and equipping.

This paper advocates reestablishing standing MEB headquarters to provide operational oversight of Marine or Joint assets in order to conduct forcible entry operations during combat or

security operations. The MEB can also better provide focus and continuity for lower-intensity, but equally important, operations such as theater security cooperation training with partner nations or relief and reconstruction operations for humanitarian crises. Particular attention will be paid to the Marine Corps' legal responsibilities under Title 10 of the United States (US) Code and the new guidance from the Commandant of the Marine Corps in the *United States Marine Corps Service Campaign Plan 2009-2015* (MCSCP). After addressing the improved operational capabilities a standing MEB could contribute, this paper will present several possibilities in lightening the load of Marines and units in order to maintain a light, expeditionary capability without sacrificing warfighting capabilities.<sup>3</sup>

The utility of the Marine Corps is obvious when acting in the capacity of a land army and is thus rewarded by more Congressional funding and equipment; however, when the Marine Corps becomes heavier, it begins to lose its unique identity and flexibility. Today's focus on sustained operations ashore, such as the Marine Corps' protracted occupation of Al Anbar, Iraq from 2004 to 2010, does not lend to the justification of maintaining a sizable amphibious fleet. Further, the current perception of the lack of utility in amphibious operations, or even substantial rapid reaction forces in general, leads to reduced funding. Ultimately, the Marine Corps must fuse Title 10 responsibilities with the changing needs of today's contemporary operating environment, but a Marine Corps whose legally mandated organization and responsibilities are not adequately supported financially or materially is a hollow force.

### **Background: Title 10 and Forcible Entry**

The Marine Corps possesses a storied past in justifying its existence. While competing for funding and resources, the Marine Corps has historically run the risk of losing its ground forces to the Army and its air forces to the Navy and Air Force, but has repeatedly found allies in

Congress to protect its interests by legislation. Lieutenant General Victor H. Krulak, in his venerated work *First To Fight: An Inside View of the U.S. Marine Corps*, posits that “the United States does not *need* a Marine Corps. . . the United States *wants* a Marine Corps.”<sup>4</sup> Similarly, a Brookings Institution study in 1976 concluded that, “[d]oing away with the Corps would be politically infeasible” but explored alternative roles for the Marine Corps ranging from augmenting the Army to assuming smaller roles as both amphibious and airborne rapid reaction forces.<sup>5</sup> Title 10 charges the Marine Corps with the “seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign” and performing “such other duties as the President may direct,” as well as developing “those phases of amphibious operations that pertain to the tactics, technique [sic], and equipment used by landing forces.”<sup>6</sup>

The *2008 National Defense Strategy* concedes that “we [Department of Defense] cannot do everything, or function equally well across the spectrum of conflict. . . we must make choices.”<sup>7</sup> On many occasions the Marine Corps has had to make choices. Marine ingenuity has led to the reinvention and survival of the Marine Corps. For example, large scale amphibious doctrine did not develop until the 1920s, Marine Corps aviation close air support did not exist prior to the Banana Wars in the 1920s and 1930s, and small wars doctrine did not formalize until the 1930s; yet the Marine Corps now operates as Marine Air-Ground Task Forces, equips and plans for amphibious operations, and currently engages in counterinsurgency operations in such places as Iraq and Afghanistan.

The Marine Corps began to atrophy in its amphibious capabilities in 2004 at the onset of a prolonged occupation in Iraq that required continuous rotations of Marines from every Marine Expeditionary Force as well as Reserves. Complications continue today with the strategic shift

towards Afghanistan with similar Marine rotations in addition to countless other irregular warfare battles such as counter-piracy and counter-terrorism. Today's Marine Corps, and the Armed Forces as a whole, faces the current draw down and redeployment from Iraq; a surge in Afghanistan; and the recent Secretary of Defense's guidance to refocus on the Department of Defense's objectives of prevailing in today's wars, preventing and deterring conflict, preparing to defeat adversaries and succeeding in a wide range of contingencies, and preserving and enhancing the all-volunteer force.<sup>8</sup> Additionally, the Chairman of the Joint Chiefs of Staff provides further guidance for the military to concentrate on the conduct of operations in the four basic categories of military activity of combat, security, engagement, and relief and reconstruction.<sup>9</sup>

A strategy-policy mismatch appears to exist in that two of the three Marine Corps' Title 10 obligations are naval in nature; however, the Marine Corps has moved away from its amphibious calling in response to today's need for heavily armed and armored ground forces conducting counterinsurgency missions far inland. The Commandant of the Marine Corps, General James T. Conway, reemphasized returning to this naval obligation in his vision statement in *Marine Corps Vision and Strategy 2025*, which states, "[o]ur future Corps will be increasingly reliant on naval deployment, preventative in approach, leaner in equipment, versatile in capabilities, and innovative in mindset."<sup>10</sup> Paradoxically, there are no provisions set in Title 10 requiring the Navy to maintain amphibious shipping to support the Marine Corps despite the intended increase on naval reliance. What is more, US Navy aircraft carriers are the only ships for which Congress mandates a set number. Title 10 guarantees the Marine Corps' size of three divisions, three air wings, and their associated support units, but it does not require

the US Navy to maintain and provide ships to the Marine Corps for the strategic importance of power projection.

The *2008 National Defense Strategy* does not specifically mention the term “forcible entry” but calls for the Department of Defense to “secure US strategic access and retain freedom of action.”<sup>11</sup> There are only three primary forcible entry deployment methods: amphibious, airborne, and air assault.<sup>12</sup> The Marine Corps requires a more robust amphibious capability because without amphibious support from the Navy, the Marine Corps is only an army with a handful of air support assets. The most challenging part of a crisis is responding in a timely fashion with regard to accessibility and a capability commensurate to address any existing threat and the Marine Corps is handicapped with only a limited amphibious capability to respond.

The Marine Corps regularly trains for large scale amphibious and air assault operations, but reserves airborne operations for small, specialized units like reconnaissance or air delivery. Of these three forcible entry methods, the first utilizes ships, but the other two rely on accessibility by air. The United States must prepare for both naval and air operations in the event that one capability becomes degraded or denied in a hostile environment, but Title 10 does not properly leverage the Marine Corps to meet the challenges in the current operating environment to conduct amphibious expeditionary operations. Title 10 guarantees the US Army the ability to have airborne or air assault assets delivered into theater in requiring the US Air Force to retain at least 299 strategic airlift aircraft capable of transporting personnel and cargo for a minimum of 2,400 nautical miles unrefueled.<sup>13</sup> There is no ship-borne guarantee to the Marine Corps for the Navy to provide a minimum number of amphibious vessels to transport an amphibious or air assault capability via surface.<sup>14</sup> This is where policy does not support the National Defense Strategy with the resources for the Marine Corps to conduct expeditionary,

forcible-entry operations. In the absence of such a policy, the Chief of Naval Operations and the Commandant of the Marine Corps must make a compromise between Navy surface combatant needs, budgetary restrictions, and Marine Corps requirements in the acquisition cycle of the Joint Capabilities Integration Development System.<sup>15</sup>

In a press briefing on December 15, 2009, General Conway explicitly stated that the Marine Corps offers the United States “an assured access from the sea.”<sup>16</sup> The Navy and Marine Corps, and even the Army, do not need ports, provided sufficient lighterage exists to support at-sea offload capabilities from “roll-on roll-off” or “logistics over the shore” shipping that can be landed on unimproved beaches. Otherwise, forces must conduct offload via air provided local air superiority, at a minimum, is attainable. According to US Army Field Manual 55-15, Transportation Reference Data, strategic sealift accounts for the transport of over 95 percent of all military tonnage required for operations.<sup>17</sup> Port and airfield seizures then become imperative for follow-on operations. Still, the Marine Corps is the only Service currently organized, trained, and equipped to conduct opposed landings. Sealift clearly becomes a critical vulnerability if there are no means to offload or secure locations to land personnel and equipment ashore. The best ground forces may be rendered impotent during a particular mission in the absence of local air superiority or the inability of ships to deliver critical supplies.

An expeditionary, forcible-entry capability must be retained, not because the littorals are a special realm reserved only for the Marine Corps, but because amphibious operations are a critical form of maneuver warfare. The littorals should not be seen as an obstacle, although amphibious operations require specialized training and equipment, but yet another way from which to employ the element of surprise to exploit the enemy. Once an amphibious landing is complete, the Marine Corps must then seamlessly convert to a traditional role for either

conventional or irregular warfare or military operations other than war. Some key logistics, command and control, and fire support capabilities may remain seabased even though Marines have phased ashore.<sup>18</sup>

In the conduct of ship-to-shore or ship-to-objective maneuver, the concept of combined arms maneuver warfare remains relevant, even for humanitarian assistance missions where lethal fires give way to the non-lethal delivery of food, water, medical services, or information. Such Marine successes include famine relief in Somalia in 1992-1993 with I Marine Expeditionary Force (MEF) supporting Operation RESTORE HOPE and tsunami relief in Indonesia in 2004-2005 with 15th Marine Expeditionary Unit (MEU) supporting Operation UNIFIED ASSISTANCE. Most recently, earthquake relief in Haiti in 2010 with the 22d and 24th MEUs supporting Operation UNIFIED RESPONSE made use of forcible entry enablers, landing craft and aircraft, to establish beachheads in the absence of a functioning port and landing zones to deliver aid in austere and remote environments. In each case supporting infrastructure for ports and airfields was either destroyed, insufficient, or non-existent in critical relief areas and therefore required extensive amphibious operations via landing craft and aircraft in order to execute the missions and establish a minimum for supporting infrastructure.

The Department of Defense defines forcible entry as the “seizing and holding of a military lodgment in the face of armed opposition.”<sup>19</sup> This definition does not include area or access denial due to natural disasters or lack of sufficient infrastructure; however, amphibious support operations can contribute to conflict prevention or crisis mitigation. Marine Corps doctrine further adds that “[k]ey to the entry phase is the presence or creation of some entry point--an available airfield or port, an assailable coast line, a suitable and supportable drop zone, or an accessible frontier.”<sup>20</sup> Maintaining a forcible entry capability, therefore, retains the utility

of amphibious operations in both hostile and non-hostile situations. Amphibious operations and seabasing allow Marines to come and go from ships without the burden of building logistic support structure ashore and are now becoming increasingly relevant to today's need for an amphibious capability.

In this time of U.S. base reductions overseas, the Marine Corps needs to maintain an amphibious capability in order to remain relevant and meet its Title 10 responsibilities. This capability may not be called upon frequently for full scale conventional warfare to take a hostile beach by amphibious assault, but will certainly be needed to conduct a range of military operations from seabases pursue vital national interests. The Marine Corps needs a fully functioning expeditionary headquarters with an experienced staff in order to meet the needs of not only manning a seabase, but also providing a persistent forward presence for partnership, cooperation, and responsiveness. The time has come to fully reestablish the Marine Expeditionary Brigade.

### **Marine Expeditionary Brigade**

The Marine Corps should build upon the special purpose MAGTFs, such as the Security Cooperation MAGTFs, called for in and outlined in the MCSCP, in order to retain a partnered, postured, and persistent presence.<sup>21</sup> This can best be accomplished by developing a standing MEB headquarters. Marine Brigades have come and gone, due to operational requirements and personnel restructuring, over the last century ranging from 4th Marine Brigade fighting at Belleau Wood in World War I and the 9th Marine Expeditionary Brigade landing at Da Nang during the Vietnam War to the more recent temporary establishments of 2d MEB redesignated as Task Force Tarawa during Operation Iraqi Freedom in 2003 and then as Task Force Leatherneck in Afghanistan during Operation Enduring Freedom in 2009-2010.



Modern MEBs, although considered MAGTFs in traditional Marine Corps fashion, lack the benefits of a standing headquarters enjoyed by MEFs and MEUs. Technically MEBs only exist on paper because MEFs internally source their staffs and equipment in order to establish a MEB headquarters.<sup>22</sup> This comes at the price of creating shortfalls within the MEFs themselves, such as the MEF Deputy Commanding General becoming the MEB Commanding General. In practice, a MEF and its associated MEB cannot fully coexist without a significant backfill of the MEF by augments from adjacent and subordinate units. Further, today's embedded MEB staff within a MEF operates under the false assumption that a MEB and its parent MEF will never deploy independently. This approach lacks focus and unity of effort in forcing MEBs to scramble to put things together and further separate themselves from the day-to-day MEF operations in which they are thoroughly engrained. A MEB requires a professional team, solely dedicated to its mission. This would further alleviate any strain on a MEF headquarters if it is called upon to execute a mission separate from that of the MEB given irreconcilable time or geographic constraints.

That is not to say that the MEB could not prepare for follow-on MEF operations if needed as in the old "MEF (Forward)" construct.<sup>23</sup> If a MEF eventually falls in on a MEB headquarters, the MEB staff can either augment the MEF staff or turn over control of units to the MEF and redeploy to continue with other missions, either alone or by receiving new units. A MEB headquarters should be an independent entity to allow MEFs to manage their day-to-day operations for deployed and garrison units. MEBs should be able to solely focus their capabilities on the mission at hand. With this new construct, a MEB may rely on MEF support, but a MEF would not rely on MEB personnel to manage MEF operations.

The *2010 Quadrennial Defense Review* (QDR) recognizes the need for expeditionary capabilities, forward presence and the ability to partner with other nations. One Marine Corps initiative is the Security Cooperation MAGTF, separate from normal MEU deployments, that task organizes for limited duration deployments to build partner nation capacity and theater security cooperation.<sup>24</sup> Unlike MEUs or Security Cooperation MAGTFs, a standing MEB headquarters would provide a persistent presence within geographic areas of responsibility (AORs) and would provide continuity with key partner nation personnel in terms of years instead of months as the smaller MAGTFs cycle through deployment rotations, usually no more than six to seven months in duration. Barring contingencies, MEUs and Security Cooperation MAGTFs have relatively fixed deployment schedules to conduct “tours” of large AORs conducting various exercises and visiting ports of call with numerous countries for periods of only a few days or weeks.

It is commendable that the Marine Corps is putting more Marines out to sea and gaining more exposure to foreign countries and maximizing the use of current amphibious shipping availability, but such short, geographically dispersed deployment cycles miss the mark on conviction, and building enduring personal, professional relationships. The seniority of MEB staff can bolster confidence in partner military leaders by serving as senior mentors and advisors, something that cannot be achieved by MEUs or Security Cooperation MAGTFs that tend to focus more on tactics, techniques, and procedures for battalion and company-level exercises. Further, a MEB focused on two or three critical countries would show US resolve in building partnerships and could provide continuity for MEUs or Security Cooperation MAGTFs transiting the area by assuming operational or tactical control as the situation requires for aggregation and thereby reduce friction from frequent turnovers and rotations. Reestablishing permanent MEB

headquarters capabilities not only facilitates combat operations, as a MEB provides the first echelon of a forcible entry capability, but also lower intensity operations such as security, engagement, and relief and reconstruction. Standing MEB headquarters may also justify the need for additional amphibious ships to serve as MEB flagships, thereby approaching the Marine Corps' overall required end strength of a 38 ship amphibious fleet.<sup>25</sup>

### **Personnel: Manning and Training**

The core staff of a MEB headquarters, prior to and during their assignment to the MEB, should become experts in their regional assignments. The MCSCP already outlines a similar initiative to assign regional specialists to MEFs to facilitate complex expeditionary operations.<sup>26</sup> A standing MEB headquarters would consist of approximately 100 to 150 personnel, smaller than a MEF headquarters, but larger than a MEU headquarters. Although not accounted for in the recent 202,000 end strength growth of the Marine Corps, sufficient personnel can be sourced from out of hide in order to conduct a trial period for the cost-benefit analysis called for in the MCSCP.<sup>27</sup> A MEB staff would have a small enough logistics footprint to be easily supported as an experiment, but large enough to conduct planning and commit to operations. Additionally, personnel assignments to MEB headquarters should be for a minimum of two years in order to alleviate the need for constant training to replace lost expertise. If successful, the standing MEB headquarters construct can expand to three standing MEB headquarters, one for each MEF.

In order to facilitate MEB operations, the Marine Corps must build upon the modularity that already exists within the Marine Corps' current organization and equipment. Infantry battalions, helicopter squadrons, and combat logistics battalions are already interchangeable for deployments as are existing group, regiment, division, and wing headquarters. Beyond the traditional elements of a MAGTF, the MEB headquarters could assume control of Unit

Deployment Program units, MEUs, Security Cooperation MAGTFs, Department of Defense Civilian Expeditionary Workforce personnel, or Department of State Civilian Response Corps personnel as required for each assigned mission. Additionally, the MEB headquarters could provide the nucleus for a Joint Task Force and assume tactical control of other Joint forces, or even coalition units.

Recent historical examples of such task organization modifications and command relationship adjustments include split Amphibious Ready Groups; the assimilation of MEUs' major subordinate elements into MEFs during Operation IRAQI FREEDOM; Task Force 58, which combined the 15th and 26th MEUs in Afghanistan for Operation ENDURING FREEDOM; and Joint Task Force Haiti for Operation UNIFIED RESPONSE supported by both the 22d and 24th MEUs. The Marine Corps continues to employ these flexible approaches, which have proven to be effective ad hoc forms of operations, but Marines do not regularly train for these methods in preparation for large scale operations. MEUs and other units transiting through a MEB AOR could build MEB proficiency by conducting exercises in addition to Maritime Prepositioning Force offload training called for by the Commandant of the Marine Corps.<sup>28</sup>

The QDR places particular emphasis on the Western Pacific region, noting its vast expanses, lack of suitable bases, and potential for partnerships.<sup>29</sup> A permanent MEB headquarters structure in the Pacific can meet the MCSCP and QDR requirements for amphibious operations and regionalization. With a standing MEB headquarters, the Marine Corps would have the potential to flourish in the environment of a destabilized Pacific Rim. Currently, the Marine Corps, and the US Armed Forces as a whole, would be caught off guard in the event of a regional crisis outside of the Western Hemisphere with current operations in the

Afghanistan-Pakistan theater and the force reduction and redeployment in Iraq.<sup>30</sup> Both of these wars forced the United States to fixate heavily on land-based counter-insurgency in desert and urban environments with moderate employment of combined arms. Other distractions still include threats from Iranian and North Korean nuclear weapons programs and counter-piracy operations off of the coast of the Horn of Africa. The complete divestiture from amphibious operations would severely impact Pacific operations, both along the coast of mainland Asia and the outlying Pacific islands, for not only humanitarian assistance, but also irregular warfare stemming from violent extremists or piracy along major sea lines of communication. In many cases, the Marine Corps' past presence in the Pacific Rim for humanitarian assistance for typhoons, tsunamis, earthquakes, and volcanic eruptions and theater security cooperation remains firmly in the minds of neighboring countries and has thus bolstered many the regional US allies' confidence, even though the United States continues its contraction from Japan and South Korea to Guam.<sup>31</sup>

The QDR calls for US Pacific Command to focus on developing new strategic relationships with Indonesia, Malaysia, and Vietnam; therefore, the ideal establishment of the first permanent MEB headquarters should take place within Pacific Command.<sup>32</sup> The new MEB staff could then focus primarily on the Pacific Command AOR and thus align with the Commandant of the Marine Corps' regional focus intent for MEFs in addition to the Marine Corps' new core competency including training, advising, and assisting foreign nations, missions once reserved for special forces, as outlined in the Marine Corps' *Vision and Strategy 2025*.<sup>33</sup> 3d MEB, currently based out of Okinawa, could serve as the proof of concept focusing on security and engagement with the capability to assimilate forces to conduct combat or relief and reconstruction operations. Depending upon available facilities and operational commitments 3d

MEB could be relocated and operate out of Guam, Diego Garcia, or even Singapore under current cooperative basing efforts.<sup>34</sup> Cooperative basing with Singapore would be ideal given its central location in relation to Indonesia, Malaysia, and Vietnam and could provide an easy one to two days sail within South China Sea, Gulf of Thailand, and Java Sea. The QDR further states that “selectively homeporting additional naval forces forward could be a cost-effective means to strengthen deterrence and expand opportunities for maritime security cooperation with partner navies.”<sup>35</sup> MEB headquarters personnel could receive accompanied permanent change of station orders to allied home ports for two to three years, but expect to be deployed aboard ship at least half of the time, not unlike MEU headquarters staff.

In order to facilitate a new MEB’s responsibilities and improve capabilities, added emphasis must be placed on expeditionary capabilities. Improvements in fire support, force protection, command and control, and logistics can aid the MEB headquarters in maintaining a small, yet potent package. Although the Department of Defense’s broad definition of an expeditionary force is “an armed force organized to accomplish a specific objective in a foreign country,” the Marine Corps adds that to be expeditionary “implies a temporary duration with the intention to withdraw from foreign soil after the accomplishment of the specified mission.”<sup>36</sup>

#### **Equipping: Light, Survivable, and Lethal**

In functioning as a second land army for Operations ENDURING FREEDOM and IRAQI FREEDOM, the Marine Corps is, in some aspects, as heavy as the US Army. General Conway noted that over the past seven years, the table of equipment for a Marine infantry battalion has increased 1000 percent for communications equipment and 350 percent for heavy weapons and rolling stock.<sup>37</sup> The move to “jointness” inherently makes the Marine Corps heavier as well. This is evident in the forced adoption of the Mine Resistant Ambush Protected

(MRAP) vehicle in response to the insurgency in Iraq, as well as the procurement of the High Mobility Artillery Rocket System and the F-35 Lightning II Joint Strike Fighter, to name a few examples. The Marine Corps has not moved away from existing Army and Navy programs for Joint ground and aviation programs respectively, but still enjoys the freedom of procuring funding for Service specific projects.

Technological limitations as well as common deployment practices limit the Marine Corps' expeditionary capabilities. In order to remain viable, expeditionary forces must be lightweight, compact, self-sufficient, easily maintained, quickly embarked, rapidly deployable, and highly mobile. Development and procurement should focus on multipurpose, modular equipment with interchangeable payloads, weapon systems, and communications pertinent to specific missions utilizing tailored combinations. Modularity and interchangeable parts also simplify logistics if a responsive reach back capability is capable of forwarding replacement components as needed. Equipment and systems should result from identified needs and not solely by the development of a capability in hopes of later identifying some utility.

“Lightening the load” of the MAGTF actually serves two purposes. First, if the Marine Corps stays light, it can still be readily called upon for the role of a second land army, provided logistics depots can push more equipment and capabilities upon Marines once they deploy into theater. Second, becoming lighter reduces the time required for embarkation and deployment as well as alleviates logistics constraints thus making the Marine Corps available for immediate retasking as the Marine Corps will always execute “such other duties as the President may direct.” Modularity and commonality are paramount, but acquisition systems do not always take them into consideration. An example of the inefficiencies of not adopting a modular approach is the Marine Corps' recently acquired High Mobility Artillery Rocket System (HIMARS).

HIMARS possesses an impressive firepower capability for the Marine Corps that is significantly lighter than the Army's heavier, tracked Multiple Launch Rocket System, but it is built on the chassis of an Army 5-ton truck instead of a standard Marine 7 1/2-ton truck. Whether through acquisition oversights or accepted risks, the Marine Corps' requirements for parts and mechanic training increased in this instance since the vehicle platforms have no commonality.

In order to improve the Marine Corp' expeditionary capacity, several categories of equipment are capable of weight reduction. Most approaches rely on technological improvements, but others rely simply on adjusting the procedures for the way the Marine Corps operates. Critical areas with easily identifiable cutbacks are in the functions of fire support, force protection, command and control, and logistics.

### **Fire Support**

One of the most important aspects of forcible entry while conducting amphibious operations is that of fire support, but in order to remain expeditionary, fire support capabilities must remain lightweight. The use of precision guided munitions (PGMs), although expensive, is ultimately more cost effective by using fewer munitions and lower yield explosives due to accuracy. Increased PGM usage therefore reduces ammunition requirements; however, massing fires proves more difficult. Multiple warheads and variable fusing options on munitions could further amplify effects for suppression purposes. Loitering Tomahawk cruise missiles or smaller fire support boats with mortar systems that can fire from six miles off of the shore could accomplish massing fires.<sup>38</sup> A program is in place to possibly add a non-line of sight launcher system to the littoral combat ships. This modular PGM weapon system has 15 missiles with a 40 kilometer range, but can only launch individual missiles in 15-second intervals.<sup>39</sup> A volley fire



capability or a multiple warhead capability should be developed in order to attain the effects of massing fires.

Rather than equipping Marines with more powerful, higher caliber weapons systems, the focus should turn to adapting new technologies to the ammunition for lighter, smaller caliber weapon systems for increased range and specifically defined desired effects on a target. Perhaps shockwave generation from a thermobaric warhead is more desirable to a fragmentary pattern since shockwaves propagate evenly compared to shrapnel.<sup>40</sup> Uniform blast patterns would increase accuracy and reduce ammunition consumption rather than taking a chance on where shrapnel actually hits. Adding a miniaturized global positioning system (GPS) guidance or laser tracking system with maneuverable fins to 60 and 81 millimeter mortar rounds could also increase accuracy and range could be extended with the addition of rocket assistance to a projectile.<sup>41</sup> Less explosives would then be required for the warhead since accuracy will improve, thus making room for the guidance systems and limiting the blast radius to reduce collateral damage. Weapon systems should still maintain the capability to sustain high rates of fire in order to mass effects if needed.

### **Force Protection**

Perhaps most controversially, armor usage could most likely be reduced based on the particular threats. Marine Corps body armor usage now has varying levels of protection; however, vehicles are too labor intensive to add and remove armor as required. In either case, armor will still be required to be transported into theater, regardless of whether forces actually use it.<sup>42</sup> There is a tradeoff between speed and armor protection though, as an enemy is less likely to hit a target that is agile and maneuverable. Marines relied on unarmored variants of High Mobility Multipurpose Wheeled Vehicles for two decades in order to remain light and fast

with an all terrain capability. Once insurgents identified the weakness of unarmored vehicles in Iraq, they began using improvised explosive devices to extract US casualties. In response, the traditionally light Marine Corps adopted large, heavily armored MRAP vehicles, which further limited mobility on narrow roads, bridges, and soft sand.<sup>43</sup> Until technology catches up to make lighter armor, such as specialized composites or plastic materials, the Marine Corps will remain heavy unless it determines that some armament can be sacrificed.<sup>44</sup> Oddly, with the importance placed on reducing the weight of the MAGTF, the Marine Corps' *2009 Concepts and Programs* includes a proposal for an armored Marine Personnel Carrier.<sup>45</sup> Conversely, the relatively new "Growler" internally transportable vehicle (ITV), which can fit inside of an MV-22, is a good example of shedding armor to increase mobility.<sup>46</sup>

### **Command and Control**

Information is now relatively easy to transmit short ranges with a multitude of wireless capabilities such as Blue Tooth or Wi-Fi so communications footprints should become smaller. The Marine Corps' focus should shift from large communications sites in small areas to widely dispersed areas with networked masses of small communications devices. The close-in covert autonomous disposable aircraft (CICADA) could provide an expansive network of secure short-range wireless devices that does not need large radio and antenna sites.<sup>47</sup> The Marine Corps could utilize long-range delivery methods such as manned or unmanned aircraft or projectiles to disperse these disposable aircraft over desired areas at any phase of an operation. Measures to counter cyber warfare, both in conventional and irregular warfare, must still be kept in mind as recently seen in Russia's 2008 incursion with Georgia with purported denial of service attacks or the recently reported insurgent interception of unencrypted unmanned aerial vehicle video streams in Afghanistan in 2009.<sup>48</sup> The high-tech systems of the United States are vulnerable in

any scenario; however, with a wide area saturated with hundreds of CICADAs, the loss of a few nodes could still be compensated for by electronics seeking usable signals from other nearby nodes with network encryption providing some level of protection from hostile intrusion.

## **Logistics**

By far the heaviest aspect of a MAGTF is the logistics required to sustain forces once deployed. If the day-to-day energy, water, medical, and billeting requirements can be reduced, a significant logistics footprint also shrinks, not only for cargo space, but for transportation. Alternate energy sources should be sought to reduce reliance on petroleum transport and reliance on non-rechargeable batteries. Solar or kinetic recharging may work for small devices, but currently have little impact. The Marine Corps should approach the National Aeronautics and Space Administration regarding the fact that space shuttles use fuel cells to generate electricity and produce water as a byproduct.<sup>49</sup> Small, inexpensive systems to reclaim waste water and urine for non-potable hygiene use only, similar to those on space stations, could also be used to augment regular potable water supplies as well.<sup>50</sup> Current limitations on fuel cell size and safety hazards exist, but dependent upon Marine Corps energy requirements and safety measures to mitigate hazards, fuel cells could be a viable source of electricity, water, and heat. If anything, they could reduce the delivery requirements of bulk fuel and water resupplies, which become critical over long distances, susceptible to roadside bombs or anti-aircraft threats.

Medical capabilities are an important concern for the Marine Corps, particularly when forces are deployed to remote locations over vast distances. Electronic book readers like Amazon's Kindle or the Sony Reader programmed with a search engine for basic first responder medical information, using a wireless connection, possibly from CICADA, to seek advice from medical personnel, and coupled with a standardized trauma kit, would profoundly reduce the

need for high demand, low density Navy Hospital Corpsmen and Army medics and augment existing Marine Corps training programs for combat lifesavers. An added camera could even share images with qualified specialists and medical personnel within a network, such as CICADA, to talk first responders through specific procedures. Once first responders stabilize the patients, more time can be allotted for the follow-on arrival of medical personnel or transportation to appropriate medical facilities. Granted, battery requirements increase in order to support such a piece of technology, but the benefit outweighs the need to train, transport, and sustain additional Corpsmen.

The most important aspect of lightening the load is remaining expeditionary. The Marine Corps does not need to stay on par with the current standards of living of other services while deployed ashore.<sup>51</sup> If Marines deploy overseas and have the same amenities as being in garrison at home, something is wrong. These excess amenities lead to the current problem of the disposition of millions of dollars of equipment that is not economically sound to redeploy from bases in Iraq.<sup>52</sup> The Marine Corps needs to avoid the construction of buildings for excessive billeting and morale, welfare, and recreation purposes on expeditionary bases. General purpose tents are an economically feasible alternative and less equipment would be left to the host nation; however, these tents will require a cost effective means for insulation in order to reduce energy requirements for heating and cooling. Additionally, the Marine Corps should continue to rely on vehicle based communications systems that can be merged into shelters rather than rely on large shelters that are, although portable, designed to stay in one place. Even large operations centers, like the unit operations center modules currently in use by the Marine Corps are too large and unwieldy for expeditionary operations, particularly when displacing frequently during maneuver warfare.

Making Marines more efficient, either tactically or administratively, contributes directly to their responsiveness and effectiveness. Exact field requirements must be specified to meet tactical needs and a cost analysis for the procurement and ruggedization of new systems and equipment, which although time consuming, will prove well worth the research if it results in reducing the expeditionary footprint of Marine units. Multipurpose, modular equipment can only enhance the capabilities of a MAGTF, and even more so a MEB headquarters since it would be reliant upon what limited amphibious ships it can utilize.

## **Conclusion**

Title 10 does not sufficiently support the Marine Corps to maintain an amphibious, forcible entry capability to meet the needs of today's operating environment; however, both the QDR and the Capstone Concept for Joint Operations acknowledge the need for future forcible entry capabilities.<sup>53</sup> The Marine Corps must maintain a viable conventional warfare capability in order to be prepared for any foreign incursion and to defend vital national interests abroad; however, the Marine Corps must also be trained and equipped to execute lower-intensity missions such as security, engagement, or relief and reconstruction operations. A careful balance must be maintained between manning, training, and equipping. Manning and equipping, together with the associated funding, must be fulfilled to the greatest extent possible. Training should be tailored according to capabilities required for the mission at hand, such as pre-deployment specific training, and the most probable missions for future contingencies, such as engagement and relief and reconstruction operations.

The Marine Corps will need access to littoral areas, regardless of access to ports capable of berthing deep draft vessels. As seen in the 2010 Haiti earthquake, Marines were able to rapidly deploy ashore and establish logistics nodes on beaches and in landing zones where no

significant infrastructure existed to support them, let alone the Haitians. In the absence of convenient bases around the world, seabased MEB headquarters in other regions such as the Gulf of Guinea, Gulf of Aden, and South China Sea can provide not only responsiveness to combat or relief operations, but also continuity for any foreign military relations. The Marine Corps can conduct a cost effective experiment by expanding amphibious capabilities and establishing a standing MEB headquarters in the Pacific Command AOR. The permanent MEB headquarters construct will prove its utility, particularly when embarked aboard amphibious shipping, by not only maintaining a persistent presence, but also in strengthening relationships with partner nations. Although the Marine Corps' planned growth to 202,000 active duty personnel did not reflect the need for this new capability due to preoccupation with a short-term focus of counter-insurgency operations in both Afghanistan and Iraq, a small experimental staff will prove its worth in establishing standing MEB headquarters.

General Krulak believed that the United States relied on the Marine Corps to be always successful, both dramatically and decisively, and be ready at a moment's notice.<sup>54</sup> Being successful is a matter of training. Regional positioning of MEBs would facilitate establishing enduring professional knowledge of their respective AORs resident within MEBs. Being ready necessitates possessing light and expeditionary equipment and the ability to organize and deploy rapidly. The Marine Corps cannot shed all of its heavier systems and equipment. A light, expeditionary force will still need to maintain the right balance of armor and firepower to remain survivable; keeping in mind that the battles of Mogadishu and Fallujah both required armored vehicles to conduct operations successfully. Modularity is the key to success and units will need to be scalable, dependent upon the size and needs of the regions, cities, and villages in which they deploy. Access to remote locations without ports, airfields, and roads will be difficult.

Maneuver from the sea and utilizing beaches will enhance success with the need for rapid landing of logistics on unimproved beaches. Amphibious, modular, multi-purpose, lightweight, expeditionary, and seabased are the required adjectives for any new concept or technology. The risks of the Marine Corps not returning to its traditional expeditionary amphibious roots are being left unprepared and irrelevant to the current operating environment.

Regardless of the intensity of a military operation, the Marine Corps still holds utility during either opposed landings in the conduct of conventional warfare for amphibious maneuver to establish a foothold in failed states or ungoverned areas or for administrative landings in support of humanitarian assistance and peacekeeping. Task Force 58, comprised of two MEUs conducted expeditionary air assault operations, from amphibious shipping, over 400 miles from the ships from which they originated into Afghanistan in November 2001. This was an excellent example of ship-to-objective maneuver, thus negating the need for amphibious operations followed by long overland movements. A standing MEB structure in the region could have facilitated operations more quickly, allowing the Marine Corps to be partnered, postured, and persistent to show its dedication to the world community. With an increase in MEB amphibious expeditionary capabilities, Marines will be poised to be the first to fight the next fight, or at least the first to conduct the next expeditionary operation as the United States' force in readiness, be it security, engagement, or relief and reconstruction.

## Appendix A

### Glossary of Acronyms

AOR	Area of Responsibility
CICADA	Close-in Covert Autonomous Disposable Aircraft
EFV	Expeditionary Fighting Vehicle
GPS	Global Positioning System
HIMARS	High Mobility Artillery Rocket System
ITV	Internally Transportable Vehicle
MAGTF	Marine Air-Ground Task Force
MCSCP	Marine Corps Service Campaign Plan
MEB	Marine Expeditionary Brigade
MEF	Marine Expeditionary Force
MEU	Marine Expeditionary Unit
MRAP	Mine Resistant Ambush Protected
PGM	Precision Guided Munition
QDR	Quadrennial Defense Review
US	United States



## Endnotes

- <sup>1</sup> According to the Commandant of the Marine Corps, the Marine Corps requires at least 38 amphibious ships in order to maintain the capability to support two MEBs, but the Navy and Marine Corps are currently assuming risk with the existing force of 33 amphibious ships, Commandant of the Marine Corps, *United States Marine Corps Service Campaign Plan 2009-2015* (Washington, DC: U.S. Marine Corps, December 9, 2009), 4. Further, the *2010 Quadrennial Defense Review Report* plans to maintain an amphibious fleet of only 29-31 ships for the 2011-2015 time period, U.S. Department of Defense, *2010 Quadrennial Defense Review Report* (Washington, DC: U.S. Department of Defense, February 1, 2010), 46, [http://www.defense.gov/QDR/images/QDR\\_as\\_of\\_12Feb10\\_1000.pdf](http://www.defense.gov/QDR/images/QDR_as_of_12Feb10_1000.pdf) (accessed February 21, 2010). General James Cartwright, Vice Chairman of the Joint Chiefs of Staff, raises additional funding issues for the high costs in the development of the Expeditionary Fighting Vehicle's (EFV) amphibious capabilities, Bill Sweetman, "Joint Chiefs Vice Chairman Sinks EFV Hopes," *Aviation Week*, August 20, 2009, [http://www.aviationweek.com/aw/generic/story\\_channel.jsp?channel=defense&id=news/EFV082009A.xml](http://www.aviationweek.com/aw/generic/story_channel.jsp?channel=defense&id=news/EFV082009A.xml) (accessed February 21, 2010).
- <sup>2</sup> James T. Conway, "DoD News Briefing with General Conway at the Pentagon," December 15, 2009, <http://www.defense.gov/transcripts/transcript.aspx?transcriptid=4526> (accessed January 15, 2010).
- <sup>3</sup> The Commandant of the Marine Corps calls for suggestions to lighten its load. Headquarters U.S. Marine Corps, "Commandant Wants Good Suggestions to Improve the Corps," Quality and Innovation Branch, January 30, 2010, <http://www.marines.mil/unit/hqmc/Pages/CommandantwantsgoodsuggestionstoimprovetheCorps.aspx> (accessed February 21, 2010).
- <sup>4</sup> Emphasis in original, Victor H. Krulak, *First to Fight: An Inside View of the Marine Corps* (Annapolis, MD: Naval Institute Press, 1999), xv.
- <sup>5</sup> Martin Binkin and Jeffrey Record, *Where Does the Marine Corps Go from Here?* (Washington, DC: The Brookings Institution, 1976), 69.
- <sup>6</sup> United States Code, Title 10 - Armed Forces. January 5, 2009, Ch. 507, Sec. 5063, [http://uscode.house.gov/download/title\\_10.shtml](http://uscode.house.gov/download/title_10.shtml) (accessed March 20, 2010).
- <sup>7</sup> U.S. Department of Defense, *2008 National Defense Strategy* (Washington, DC: U.S. Department of Defense, June 2008), 20, <http://www.defense.gov/news/2008%20National%20Defense%20Strategy.pdf> (accessed February 21, 2010).
- <sup>8</sup> U.S. Department of Defense, *2010 Quadrennial Defense Review Report*, 11-16.
- <sup>9</sup> U.S. Department of Defense, *Capstone Concept for Joint Operations* (Washington, DC: U.S. Department of Defense, January 15, 2009), 14, [http://www.jfcom.mil/newslink/storyarchive/2009/CCJO\\_2009.pdf](http://www.jfcom.mil/newslink/storyarchive/2009/CCJO_2009.pdf) (accessed February 21, 2010).

<sup>10</sup> Headquarters U.S. Marine Corps, *Marine Corps Vision and Strategy 2025* (Washington, DC: U.S. Marine Corps, 2008), 6.

<sup>11</sup> United States Code, Ch. 507, Sec. 5062-5063, and U.S. Department of Defense, 2008 *National Defense Strategy*, 16.

<sup>12</sup> Chairman of the Joint Chiefs of Staff, *Joint Forcible Entry Operations*, Joint Publication 3-18 (Washington, DC: U.S. Department of the Defense, June 16, 2008), ix.

<sup>13</sup> United States Code, Ch. 807, Sec. 8062.

<sup>14</sup> Even the US Army “includes land combat and service forces and such aviation and water transport as may be organic therein.” United States Code, Ch. 307, Sec. 3062.

<sup>15</sup> Joseph H. Alexander and Merrill L. Bartlett, *Sea Soldiers in the Cold War: Amphibious Warfare, 1945-1991* (Annapolis, MD: Naval Institute Press, 1999), 62-86, provides excellent historical insight into differing US Navy and Marine Corps priorities for amphibious capabilities.

<sup>16</sup> Conway.

<sup>17</sup> U.S. Department of the Army, *Transportation Reference Data*, FM 55-15 (Washington, DC: U.S. Department of the Army, October 1997), 5-41.

<sup>18</sup> The Department of Defense defines seabasing as “the deployment, assembly, command, projection, reconstitution, and reemployment of joint combat power from the sea without reliance on land bases within the [Joint Operations Area]” and further “increases the maneuver options for [Landing Forces] ashore by reducing the need to protect elements such as [command and control] and logistic supplies.” Chairman of the Joint Chiefs of Staff, *Amphibious Operations*, Joint Publication 3-02 (Washington, DC: U.S. Department of Defense, August 10, 2009), xxiii.

<sup>19</sup> Chairman of the Joint Chiefs of Staff, *Joint Forcible Entry Operations*, GL-6.

<sup>20</sup> U.S. Marine Corps, *Expeditionary Operations*, Marine Corps Doctrinal Publication 3 (Washington, DC: U. S. Marine Corps, April 16, 1998), 40-41.

<sup>21</sup> Headquarters U.S. Marine Corps, *Vision and Strategy*, 15.

<sup>22</sup> Marine Corps Combat Development Command, *Amphibious Operations in the 21st Century*, (Quantico, VA: Marine Corps Combat Development Command, March 18, 2009), 21, <http://www.quantico.usmc.mil/seabasing/resources/Articles/amphib%20Ops%20in%20the%2021st%20Century.pdf> (access February 21, 2010).

<sup>23</sup> U.S. Marine Corps, *Expeditionary Operations*, 74.

<sup>24</sup> U.S. Marine Corps, *Send in the Marines: A Marine Corps Operational Employment Concept to Meet an Uncertain Security Environment* (Washington, DC: U.S. Marine Corps, 2008), 17.

<sup>25</sup> The planned Maritime Prepositioning Force (Future) will have three landing helicopter assault or landing helicopter dock amphibious assault ships in a squadron beginning in the 2017-2022 timeframe. Headquarters U.S. Marine Corps, *2009 Concepts and Programs* (Washington, DC: U.S. Marine Corps, 2009), 162-163. By not assigning these types of ships to the operating forces, the ability to man, train, and equip these ships on short notice for forcible entry operations is a considerable source of friction.

<sup>26</sup> Commandant of the Marine Corps, *United States Marine Corps Service Campaign Plan*, 11.

<sup>27</sup> Commandant of the Marine Corps, *United States Marine Corps Service Campaign Plan*, 6.

<sup>28</sup> Commandant of the Marine Corps, *United States Marine Corps Service Campaign Plan*, 6.

<sup>29</sup> U.S. Department of Defense, *2010 Quadrennial Defense Review Report*, 65-67.

<sup>30</sup> “Our defense objectives within the Western Hemisphere do not require a robust forward presence.” U.S. Department of Defense, *2010 Quadrennial Defense Review Report*, 68.

<sup>31</sup> “For example, the contribution of U.S. and partner forces to relieve the distress caused by the catastrophic Pacific tsunami of December 2004 reversed the perceptions of America held by many Indonesians. Perhaps no other mission performed by the Joint Force provides so much benefit to the interests of the United States at so little cost.” U.S. Joint Forces Command, *Joint Operating Environment 2010* (Suffolk, VA: U.S. Joint Forces Command, February 18, 2010), 33, [http://www.jfcom.mil/newslink/storyarchive/2010/JOE\\_2010\\_o.pdf](http://www.jfcom.mil/newslink/storyarchive/2010/JOE_2010_o.pdf) (accessed March 20, 2010). “We will continue to transform overseas U.S. military presence through global defense posture realignment, leveraging a more agile continental U.S. (CONUS)-based expeditionary total force and further developing a more relevant and flexible forward network of capabilities and arrangements with allies and partners to ensure strategic access.” *2008 National Defense Strategy*, 16.

<sup>32</sup> U.S. Department of Defense, *2010 Quadrennial Defense Review Report*, 59.

<sup>33</sup> Headquarters United States Marine Corps, *Vision and Strategy*, 10 and Robert M. Gates, “Remarks to the Heritage Foundation (Colorado Springs, CO),” May 13, 2008, <http://www.defense.gov/utility/printitem.aspx?print=http://www.defense.gov/speeches/speech.aspx?speechid=1240> (accessed January 15, 2010).

<sup>34</sup> U.S. Department of Defense, *2010 Quadrennial Defense Review Report*, 66.

<sup>35</sup> U.S. Department of Defense, *2010 Quadrennial Defense Review Report*, 34.

<sup>36</sup> Chairman of the Joint Chiefs of Staff, *Joint Operations*, Joint Publication 3-0 (Washington, DC: U.S. Department of the Defense, February 13, 2008), GL-13 and U.S. Marine Corps, *Expeditionary Operations*, 35.

<sup>37</sup> Conway.

<sup>38</sup> Defense Industry Daily, <http://www.defenseindustrydaily.com/firing-nemo-finns-take-different-tack-on-naval-fire-support-03371/> (accessed January 18, 2010).

<sup>39</sup> Raytheon, [http://www.raytheon.com/newsroom/rtnwcm/groups/rms/documents/content/rtn\\_rms\\_ps\\_nlos\\_datasheet.pdf](http://www.raytheon.com/newsroom/rtnwcm/groups/rms/documents/content/rtn_rms_ps_nlos_datasheet.pdf) (accessed February 21, 2010).

<sup>40</sup> GlobalSecurity.org, Military, <http://www.globalsecurity.org/military/systems/munitions/60mm-tbx.htm> (accessed January 17, 2010).

<sup>41</sup> GPS and laser guidance systems have been developed for 120 millimeter mortar systems, GlobalSecurity.org, Military, <http://www.globalsecurity.org/military/library/news/2009/06/mil-090601-raytheon02.htm> (accessed on January 17, 2010) and <http://www.globalsecurity.org/military/systems/munitions/pgmm.htm> (accessed January 17, 2010).

<sup>42</sup> Commandant of the Marine Corps, *Establishment of Body Armor Protection Levels*, MarAdmin 0415/09, July 10, 2009, <http://www.marines.mil/news/messages/Pages/MARADMIN0415-09.aspx> (accessed January 22, 2010).

<sup>43</sup> Conway.

<sup>44</sup> Conway.

<sup>45</sup> Headquarters U.S. Marine Corps, *2009 Concepts and Programs*, 103.

<sup>46</sup> Andrew Tilghman, “Corps Set to Begin Fielding ITV This Summer,” *Marine Corps Times*, June 10, 2008, [http://www.marinecorpstimes.com/news/2008/06/marine\\_ITV\\_060808w/](http://www.marinecorpstimes.com/news/2008/06/marine_ITV_060808w/) (accessed January 17, 2010).

<sup>47</sup> Aaron D. Kahn and Richard J. Foch, “High Packing Efficiency EAV for Local Area Seeding,” (concept paper, Naval Research Laboratory, 2006), 1, <http://www.nrl.navy.mil/vrs/pdfs/06-1226-1085.pdf> (accessed January 22, 2010).

<sup>48</sup> John Markoff, “Before the Gunfire, Cyberattacks,” *The New York Times*, August 12, 2008, <http://www.nytimes.com/2008/08/13/technology/13cyber.html> (accessed February 20, 2010) and Siobhan Gorman, Yochi J. Dreazen, and August Cole, “Insurgents Hack U.S. Drones,” *The Wall Street Journal*, December 17, 2009, <http://online.wsj.com/article/SB126102247889095011.html> (accessed February 20, 2010).

<sup>49</sup> National Aeronautics and Space Administration, Space Settlements, [http://settlement.arc.nasa.gov/teacher/course/h2o\\_gen.html](http://settlement.arc.nasa.gov/teacher/course/h2o_gen.html) (accessed January 17, 2010).

<sup>50</sup> National Aeronautics and Space Administration, Space Settlements, <http://settlement.arc.nasa.gov/teacher/course/water.html> (accessed January 17, 2010).

<sup>51</sup> Conway and David Martin, “Top General Bars Fast Food on Afghan Bases,” CBSNews.com, February 19, 2010, <http://www.cbsnews.com/stories/2010/02/19/eveningnews/main6224940.shtml> (accessed March 21, 2010).

<sup>52</sup> Ernesto Londono, “Millions’ Worth of Gear Left in Iraq,” *Washington Post*, December 7, 2009, <http://www.washingtonpost.com/wp-dyn/content/article/2009/12/06/AR2009120602689.html> (accessed January 21, 2010).

<sup>53</sup> U.S. Department of Defense, *2010 Quadrennial Defense Review Report*, 41 and U. S. Department of Defense, *Capstone Concept for Joint Operations*, 31.

<sup>54</sup> Krulak, xv.

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